

10/577,695 Response to Office Action of August 31, 2009 RECEIVED
CENTRAL FAX CENTER

Page 2 of 6

Listing of the Claims:

OCT 20 2009

This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1 – 9: (Cancelled).

10. (Previously amended) A process for continuously preparing an ethylene homopolymer or copolymer in a high-pressure tube reactor in presence of at least one free-radical polymerization initiator and, optionally, at least one molecular weight regulator at from 120°C to 350°C and a pressure from 1000 to 4000 bar, wherein the ethylene homopolymer or copolymer is separated from unpolymerized ethylene and optionally from comonomers in a high-pressure stage at a pressure from 100 to 500 bar and at least one low-pressure stage at a pressure from 1 to 100 bar, the unpolymerized ethylene separated off in the high-pressure stage is separated from any remaining monomeric, oligomeric and/or polymeric constituents and is re-circulated to a first inlet of the tube reactor in a high-pressure circuit, and the unpolymerized ethylene separated off in the low-pressure stage is separated from any remaining monomeric, oligomeric and/or polymeric constituents and is re-circulated to a second inlet of the tube reactor in a low-pressure circuit, wherein the free-radical polymerization initiator is used as a solution in an isoparaffinic solvent, the isoparaffinic solvent comprising a boiling point equal to or less than 160°C, and the isoparaffinic solvent is separated from the monomeric, oligomeric and/or polymeric constituents in the low-pressure circuit, and the isoparaffinic solvent is reused for dissolving the free-radical polymerization initiator.

11. (Previously amended) The process of claim 10, wherein the isoparaffinic solvent is separated off in the low-pressure circuit by means of at least one first gas-liquid separator and at least one last gas-liquid separator connected in series, with the temperature being reduced from separator to separator so that the monomeric, oligomeric or polymeric constituents are separated out in a first gas-

10/577,695 Response to Office Action of August 31, 2009 Page 3 of 6

liquid separator and the isoparaffinic solvent is essentially separated out as liquid in a last gas-liquid separator.

12. (Previously amended) The process of claim 10, wherein the isoparaffinic solvent has a boiling point equal to or less than 150°C.

13. (Previously amended) The process of claim 10, wherein the isoparaffinic solvent has a boiling point equal to or less than 135°C.

14. (Previously presented) The process of claim 10, wherein the isoparaffinic solvent which has been separated off is used without further purification for dissolving the free-radical polymerization initiator.

15. (Previously presented) The process of claim 11, wherein the pressure upstream of the last gas-liquid separator is increased such that the isoparaffinic solvent condenses while ethylene monomer is in a gaseous state.

16. (Previously amended) The process of claim 10, wherein the isoparaffinic solvent has a spontaneous ignition temperature of at least 250°C.

17. (Previously amended) The process of claim 10, wherein the isoparaffinic solvent has a spontaneous ignition temperature of at least 300°C.

18. (Previously amended) The process of claim 10, wherein the isoparaffinic solvent is a mixture of which at least one isoparaffin has a boiling point from 100 to 150°C.

19. (Previously amended) The process of claim 10, wherein the isoparaffinic solvent is a mixture of which at least one isoparaffin has a boiling point from 110 to 140°C.

10/577,695 Response to Office Action of August 31, 2009 Page 4 of 6

20. (Currently amended) An apparatus for polymerizing ethylene at high-pressure and, optionally, in the presence of one or more comonomers comprising:

- a) a high-pressure tube reactor comprising at least one feed point for monomer and at least one feed point for a solution of polymerization initiators;
- b) at least one mixing vessel for dissolving the polymerization initiators in an isoparaffinic solvent having a boiling point equal to or less than 160°C, connected to the at least one feed point;
- c) at least one high-pressure stage and at least one low-pressure stage for separating unpolymerized reaction constituents from the polymer product;
- d) at least one high-pressure circuit for re-circulating the monomer separated off in the high-pressure stage to the feed point of the high-pressure tube reactor;
- e) at least one low-pressure circuit for re-circulating monomer separated off in the low-pressure stage, the low-pressure circuit comprising at least one first separator for separating other reaction constituents from the monomer and solvent, and at least one last separator for separating the solvent from the monomer, with at least one heat exchanger between the first separator and the last separator ~~exchangers between separators~~; and
- f) a return line for re-circulating the solvent from the last separator to the mixing vessel.

21. (Currently amended) The apparatus of claim 20, comprising a stock vessel between the return line and a the mixing vessel.